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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/081,369 | 02/22/2002 | Barrett E. Cole | H0002243 | 2959 |

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EXAMINER

WILLE, DOUGLAS A

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2814

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-----------------|--------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/081,369 | COLE ET AL. | |
| | Examiner | Art Unit | |
| | Douglas A Wille | 2814 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24, 42 and 43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 42 is/are allowed.
- 6) ☒ Claim(s) 1-17, 19-24 and 42 is/are rejected.
- 7) ☒ Claim(s) 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1203</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 – 4, 9 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al. in view of Tokuda et al.
3. With respect to claims 1 and 47, Cole et al. show (see cover Figure and column 2, line 9 et seq.) a detector for spectroscopic detection (see abstract) with detectors 14 and tunable Fabry-Perot filter 22, 20. Tokuda et al. show a detector (see Figure 12 and column 3, line 15) with stacked detectors with different wavelength sensitivity (see Figure 11) which has enhanced wavelength selectivity (column 2, line 10). It would have been obvious to use the Tokuda et al. detector in the Cole et al. device to improve the wavelength sensitivity. Note that what is passed by the Fabry-Perot is examined.
4. With respect to claim 2, the detectors are stacked.
5. With respect to claim 3, the Cole et al. Fabry-Perot is tunable.
6. With respect to claim 4, the filter is a Fabry-Perot.
7. With respect to claim 9, Cole et al. shows the substrate could be sapphire or glass (column 2, line 24).
8. Claims 5 - 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al. in view of Tokuda et al. and further in view of Hier et al. and Koslowski et al.

Art Unit: 2814

9. With respect to claims 5 and 6 Cole et al. shows that the device could operate in the visible region (column 2, line 38) Hier et al. show that a programmable multiwavelength detector array operating in the visible and UV (see Figures 2 and 4 and column 2, line 60) could be GaN/AlGaIn and could be stacked vertically (column 3, line 67). It would have been obvious to include the materials shown by Hier et al. in the Cole et al. device to provide the visible wavelength and to extend the operating region to shorter wavelengths. Koslowski et al. show that UV imagers could be formed with AlGaIn, GaN and InGaIn (table 1, column 5). It would have been obvious to include all the materials shown by Koslowski et al. to provide the widest possible wavelength range to increase the utility of the device.

10. With respect to claims 7 and 8, Koslowski et al. show that the claimed wavelengths can be reached with the materials shown.

11. With respect to claim 12, Hier et al. show (Figure 2 and column 2, line 61) a stacked detector where light enters through the substrate. It would have been obvious to modify the basic device to include light entering through the substrate since all contacts and contact wires will be directed away from the detectors and will not obscure them.

12. Claims 10, 11, 13 – 17, 19, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al. in view of Tokuda et al. and Yokoi.

13. With respect to claims 10, 11, 17 and 23, Cole et al. shows the device can be used to evaluate external sources (see Figure 18 and column 7, line 55). Yokoi shows (see column 1, line 10) that living tissues and cells can be evaluated by using fluorescence spectroscopy using a laser. It would have been obvious to use the Cole et al. device for the application shown by Yokoi to expand its capabilities.

Art Unit: 2814

14. With respect to claim 13, as noted by Applicant, charge detectors are standard devices and their use would be obvious.

15. With respect to claims 14 and 15, Cole shows a Fabry-Perot substrate, and a detector substrate. It would be obvious to include the charge detector on another substrate since it is an electronic device and not an optical device and the use of circuitry to operate the device would also be obvious.

16. With respect to claim 16, Cole et al. show two substrates and the detector of Tokuda et al. would be on the second substrate.

17. With respect to claim 19, the Cole et al. filter is a Fabry-Perot.

18. With respect to claim 24, Cole et al. show that both glass and sapphire substrates can be used with the sapphire being appropriate for the growth of GaN compounds and the use of glass for the filter is a function of the desired transmission and the cost of the substrate and the choice is a design alternative.

19. Claims 20- 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al. in view of Tokuda et al. and Yokoi and further in view of Hier et al. and Koslowski et al.

20. With respect to claims 20 and 21, Cole et al. shows that the device could operate in the visible region (column 2, line 38) Hier et al. shows that a programmable multiwavelength detector array operating in the visible and UV (see Figures 2 and 4 and column 2, line 60) could be GaN/AlGa_N and could be stacked vertically (column 3, line 67). It would have been obvious to include the materials shown by Hier et al. in the Cole et al. device to provide the visible wavelength and to extend the operating region to shorter wavelengths. Koslowski. et al. show that UV imagers could be formed with AlGa_N, GaN and InGa_N (table 1, column 5). It would

Art Unit: 2814

have been obvious to include all the materials shown by Koslowski et al. to provide the widest possible wavelength range to increase the utility of the device.

21. With respect to claim 22, Koslowski et al. show that the claimed wavelengths can be reached with the materials shown.

Allowable Subject Matter

22. Claim 18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

23. Claim 42 is allowed.

24. Cole et al. show a sealing support 30 and Kozlowski et al. show a bump bond but it would not be obvious to use the bump bond in place of the Cole et al. support since it does not provide a complete seal.

Response to Arguments

25. Applicant's arguments filed 12/29/03 have been fully considered but they are not persuasive. Applicant states that there is no reason to combine the references but note that Cole et al. shows the use of a microbolometer as a detector, depending on the Fabry-Perot to provide all the wavelength selectivity. Note also that Cole shows that the wavelength range passed by the Fabry-Perot could be large (Figure 16a). Tokuda et al., as noted above, provides a method of increasing the selectivity of a detector. Since increasing the selectivity of a detector is an improvement, it would be applicable to any detector, including the Cole et al. detector. Thus the combination is justified. Applicant states that all the wavelengths are removed by the Fabry-Perot but this is not necessarily so since the transmission of the Fabry-Perot could be relatively

Art Unit: 2814

wide. Note again that Tokuda et al. show how the resolution can be improved and incorporation of this feature would be obvious to gain the improvement.

26. Applicant states that claim 12 has an inband source but in fact claim 10 has this feature and this is addressed in the rejection of claim 10.

27. Applicant states that the different materials claimed in claim 5 are not shown but Kozlowski et al. show the use of AlGaN which is a generic formula for the material class and covers the various combinations.

28. Applicant states that Yokoi does not provide a justification for combining Cole et al. and Tokuda et al. but it was never stated that such a justification is provided.

29. Applicant states that the references do not show the limitation of claim 17 but claim 17 states simply that the detector elements are stacked, which is what is shown in the prior art applied.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A Wille whose telephone number is (571) 272-1721. The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Application/Control Number: 10/081,369

Page 7

Art Unit: 2814

A handwritten signature in black ink, appearing to read "Douglas A. Wille". The signature is fluid and cursive, with the first name "Douglas" being more prominent and the last name "Wille" following in a similar style.

Douglas A. Wille
Primary Examiner

March 25, 2004